AIRCRAFT CHARACTERISTICS FOR AIRFIELD-HELIPORT DESIGN AND EVALUATION

AIRCRAFT GEOMETRY

C-1. This appendix presents US Army, US Air Force, and selected civil and commercial aircraft geometries and tire pressures required by civil engineers in the layout, design, or evaluation of airfield and heliport pavement systems.

C-2. The data are arranged in figure format for various military, civil, and commercial fixed-wing aircraft (figs C-1 to C-110). Military and commercial rotary-wing aircraft data are presented in figures C-111 to C-168.

C-3. Fixed-wing aircraft are grouped by military (figs C-1 to C-52) and civil and commercial (figs C-53 to C-l10). Military aircraft are further subgrouped as follows:

a. Bomber Aircraft.

Figure	Aircraft
C-1	B-1B
C-2	B-52
C-3	FB-111A

b. Cargo/Transport Aircraft.

Figure	Aircraft
C-4	C-5
C-5	C-7A
C-6	C-9A
C-7	C-12
C-8	C-17A
C-9	C-20A/B
C-10	C-21A
C-11	C-22B
C-12	C-23A
C-13	C-130
C-14	G-135B and KC-135R
C-15	C-137
C-16	C-140A/B
C-17	C-141
C-18	KC-lOA
C-19	VC-25A

c. Special-Duty Aircraft.

Figure	Aircraft
C-20	E-3A/B/C
C-21	E-4A/B
C-22	EC-18B
C-23	EC-130E/H, MC-130E/H, and WC-130E/H
C-24	EC-135, RC-135, and WC-135
C-25	EP-111A
C-26	O-2A/B
C-27	OA-37B
C-28	OV-1
C-29	OV-1OA
C-30	RC-12D/C/H/K and U-21J
C-31	RF-4C
C-32	RU-21A/H and U-21A/D/G
C-33	SR-71A
C-34	TR-1 and U-2
C-35	U-8F
C-36	U-10A
C-37	U-21F
C-38	UV-18

d. Tactical Aircraft.

Figure	Aircraft
C-39	A-7
C-40	A-lOA
C-41	A-37B
C-42	AC-130
C-43	F-4
C-44	F-5
C-45	F-15
C-46	F-16
C-47	F-100
C-48	F-101B
C-49	F-104C
C-50	F-105
C-51	F-106A/B
C-52	F- lllA/D/E/F

C-4. Civil and commercial aircraft are subgrouped as follows:

a. Eight Thousand Pounds or Less, Piston and Turboprop.

(1) Single engine, high wing, tailwheel (fig C-53).

(2) Single engine, high wing, tricycle gear (fig C-54).

(3) Single engine, low wing, tricycle gear (fig C-55).

(4) Twin engine, low or mid wing, tricycle gear (fig C-56).

(5) Twin engine, high wing, tricycle gear (figs C-57 and C-58).

b. More Than 8,000 to 12,500 Pounds, Piston and Turboprop.

Figure	Aircraft
C-59	Beechcraft Model 18
C-60	Beechcraft Queen Air
C-61	Beechcraft King Air
C-62	Beechcraft 99A
C-63	Swearingen Merlin II and III
C-64	Swearingen Merlin IV and Metro
C-65	DeHavilland Canada DHC-6
C-66	Hawker Siddeley Dove
C-67	Mitsubishi MU-2
C-68	Short Brothers Variants (Model SC.7)

c. More Than 12,500 Pounds, Piston and Turboprop.

Figure	Aircraft
C-68	Short Brothers Variants (Model SC.7-3M, 330, 360)
C-69	Convair-Liner
C-70	Douglas DG-3
C-71	Fairchild F-27 and FH-227
C-72	Grumman Gulfstream I
C-73	Martin 404
C-74	Aerospatiale Nord 262
C-75	Hawker Siddeley Heron
C-76	Hawker Siddeley HS-748
C-77	Nihon/N.A.M.C. YS-llA
C-78	Douglas DG-4/6/7
C-79	Lockheed L-188
C-80	Lockheed L-382
C-8l	Lockheed Constellation and Super Constellation
C-82	B.A.C./Vickers Viscount

d. Sixty Thousand Pounds or Less, Turbojet and Turbofan.

Figure	Aircraft
C-B3	Cessna Citation
C-84	Gates Learjet
C-85	Grumman Gulfstream II
C-86	Lockheed 1329
C-B7	Rockwell International NA-265
C-88	Avions Marcel Dassault Mystere 20
C-89	Fokker F-2B
C-90	Hamburger-Flugzeugbau HFB-320
C-91	Hawker Siddeley HS-125
C-92	Israel Aircraft Commodore Jet

e. More Than 60,000 Pounds, Turbojet and Turbofan.

Figure	Aircraft
C-93	Boeing 707 and 720
C-94	Boeing 727
C-95	Boeing 737
C-96	Boeing 747
C-97	Boeing 757
C-98	Boeing 767
C-99	General Dynamics/Convair 880 and 990
C-100	Lockheed L-l0ll
C-101	McDonnell Douglas DC-B
G-102	McDonnell Douglas DC-9 and MD-80
G-103	McDonnell Douglas DC-l0
C-104	Aerospatiale/Sud-Aviation SE-210
C-l05	B.A.C. One-Eleven
C-106	B.A.C./Vickers VC-10
C-107	Ilyushin IL-62
C-108	Airbus Industries A300, A310, A320
C-109	B.A.C./SNIAS Concorde
C-110	British Aerospace 146

C-5. The following correspondence between symbols and actual dimensions is employed in figures C-l to C-lb. An entry of "†" indicates data are not available. Dimensions are in feet unless otherwise stated.

Symbol	Dimension
A	Wingspan
B	Length overall
C	Height overall Wheelbase
E	Nose to centerline of main gear
F	Wheel track (tread)
G	Centerline of fuselage to centerline of inboard engine
H	Centerline of fuselage to centerline of outboard engine
J	Outside of main gear to wingtip
K	Vertical clearance of inboard engine or propeller at maximum weight
L	Vertical clearance of outboard engine or propeller at maximum weight
M	Centerline of fuselage to approximate pivot point based on maximum nosewheel steering angle or locked wheels
N	Vertical clearance of wingtip at maximum weight
P	Height of exhaust of jet engine on centerline of fuselage (three-engine jet aircraft only)

C-6. Rotary-wing aircraft are grouped and presented in alphabetical order by aircraft manufacturer (figs C-111 to C-168). Military aircraft designation; if applicable, is identified within parenthesis of the figure title. Military and commercial aircraft are presented as follows:

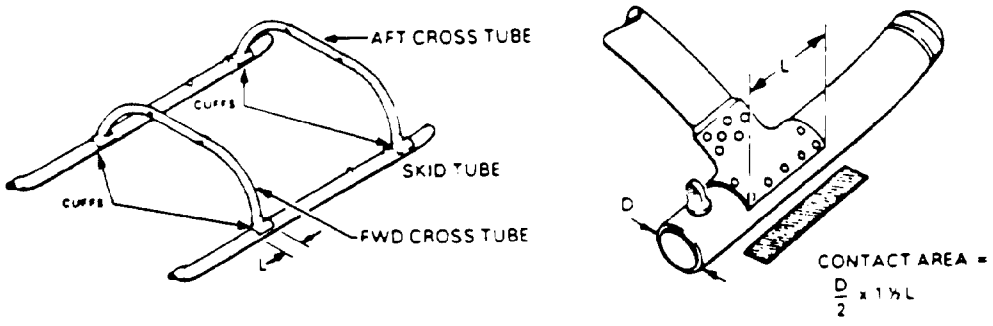
Figure	Aircraft
C-111	Aerospatiale 315B
C-112	Aerospatiale 3303
C-113	Aerospatiale 332C/L
C-114	Aerospatiale 341
C-115	Aerospatiale 350B/D
C-116	Aerospatiale 355E/F/F1
C-117	Aerospatiale 360C
C-118	Aerospatiale 365C
C-119	Aerospatiale 365N
C-120	Agusta 109A and 109A MkII
C-121	Bell 47G-3B (OH-13 and TH-13T)
C-122	Bell 47G-5A
C-123	Bell 204 (UH-1B/C/M)
C-124	Bell 205 (UH-1D/H)
C-125	Bell 205A-l
C-126	Bell 206A (OH-58A/C)
C-127	Bell 206B
C-128	Bell 206L-3
C-129	Bell 209 (AH-1G), [AH-1S(Production)], [AH-1S (ECAS)], [AH-1S(Modernized)]
C-130	Bell 212 (UH-1N)
C-131	Bell 212
C-132	Bell 214B
C-133	Bell 214ST
C-134	Bell 22Z and 222B
C-135	Bell 222UT
C-136	Bell 406 Al-UP (OH-58D)
C-l37	Bell 412
C-138	Bell/Boeing 301 (V-22)
C-139	Boeing 107-II
C-140	Boeing 114 (CH-47B/C/D)
C-141	Boeing 234 LR/ER/UT/MLR
C-142	Boeing 360

Figure	Aircraft
C-143	E.H. Industries EH 101
C-144	Enstrom 280C, F2BC-2, 280F, 2BOFX and F2BF
C-145	Hynes H-2/with skid landing gear
G-146	Hynes H-2/with wheel landing gear
C-147	Hynes H-S/with skid landing gear
C-148	Hynes H-S/with wheel landing gear
C-149	MBB BO 105 GB/CBS/IS
C-150	MBB/Kawasaki BK 117
C-151	McDonnell Douglas 77 (AH-64A)
C-152	McDonnell Douglas 500 (OH-6A)
C-153	McDonnell Douglas 500D
C-154	McDonnell Douglas 530F
C-155	Robinson R22
C-156	Rogerson Hiller RH-ll00
C-157	Rogerson Hiller UH-12E/E4/ET/E4T
C-15B	Schweizer 269A (TH-55A)
C-159	Schweizer 300C
C-160	Sikorsky S-5BT
C-161	Sikorsky S-61N
C-162	Sikorsky S-62
G-163	Sikorsky S-64 (CH-54A)
C-164	Sikorsky S-65A (CH-53C and HH-53C)
C-165	Sikorsky S-70 (HH-60A and UH-60A)
C-166	Sikorsky S-70C
C-167	Sikorsky S-76A/B
C-168	Westland 30-100-60, 30-200 and 30-300

C-7. The following correspondence between symbols and actual dimensions is employed in figures C-111 to C-168. An entry of “†” indicates data are not available. Dimensions are in feet unless otherwise stated.

Symbol	Dimension
A	Overall width; also, main rotor diameter
B	Overall length. The distance from the tip of the main or forward rotor to the tip of the tail rotor or fin with rotors at their maximum extension
C	Overall height
D	Wheelbase. Distance between front and rear axles for wheel equipped helicopters. Distance between front and rear attachment points for skid equipped helicopters
Dl	Skid length
E	Tread. Distance between tire or skid centers
F	Distance from center of rear wheel to tip of the tail rotor or fin for wheel equipped helicopter. Distance from rear of skid to tip of the tail rotor or fin for skid equipped helicopter
G	Distance from front fuselage to tip of the tail rotor or fin
H	Tail rotor diameter
J	Height to top of rotor head

C-8. The following information and figure are provided to clarify the computation of contact area for skid equipped helicopters. The contact area is computed for the strengthened “cross tube” attachment point or cuff.



MAXIMUM TIRE PRESSURE, PSI		A	B	C	D	E	F	G	H	J	K	L	M	N
MAIN GEAR	NOSE GEAR													
220	210	136.7	151.1	33.6	56.5	†	14.5	†	†	†	4.3	4.3	17.3	8.0

Figure C-1. B-1B (Rockwell International)

MODEL	MAXIMUM TIRE PRESSURE, PSI		A	B	C	D	E	F	G	H	J	K	L	M	N
	MAIN GEAR*	NOSE GEAR**													
G	305	265	185 0	161 9	40.7	49 8	92 0	8 3	34 2	60 0	86 2	6 3	4 7	39 0	5 5
H	305	265	185 0	160 4	40.7	49 8	92 0	8 3	34 2	60 0	86 2	6 3	4 7	39 0	5 5

* MAIN GEAR IS AFT GEAR
** NOSE GEAR IS FORWARD GEAR

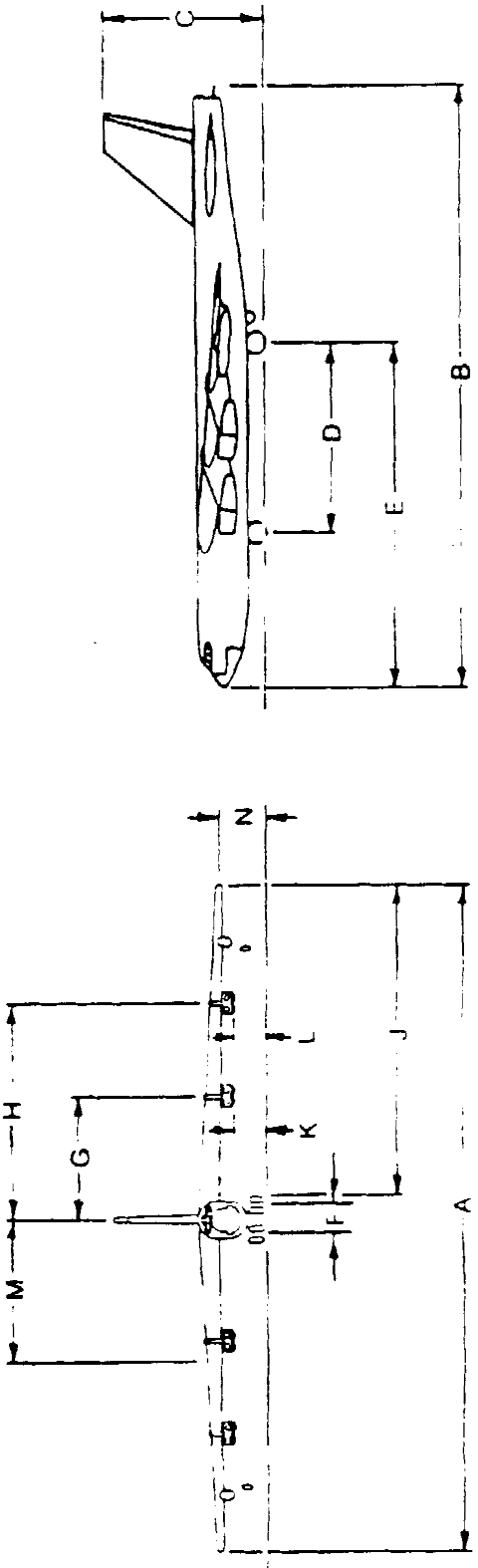


Figure C-2. B-52, Stratofortress (Boeing)

MAXIMUM TIRE PRESSURE, PSI		A	B	C	D	E	F	G	J	K	M	N
MAIN GEAR	NOSE GEAR											
215	315	70.0	75.7	17.4	24.0	48.2	10.0	†	29.4	†	28.7	7.8

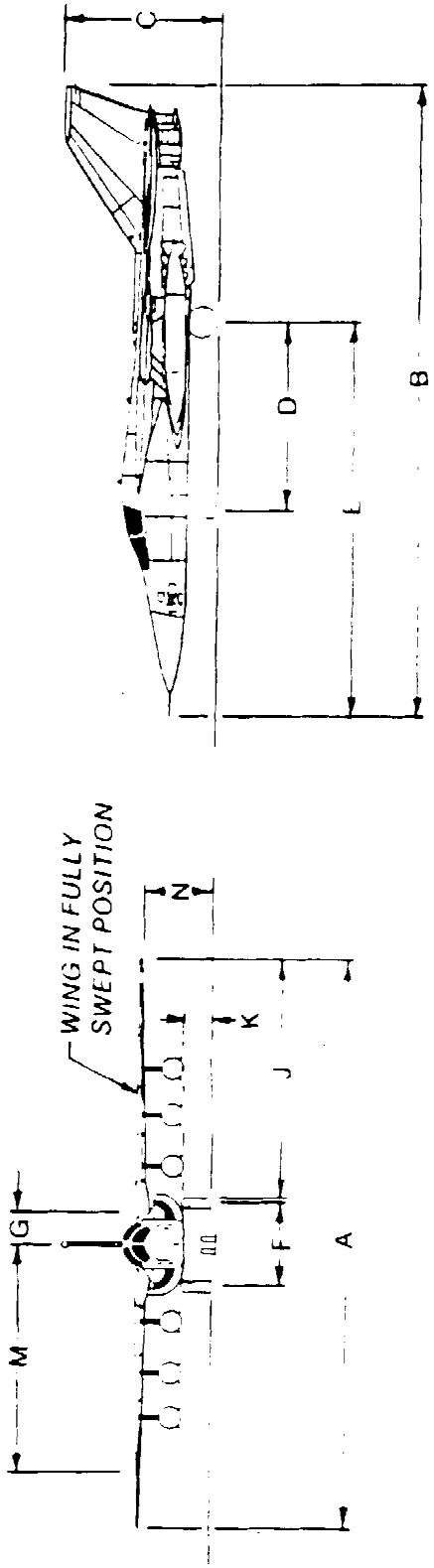


Figure C-3. FB-111A (General Dynamics)

MODEL	MAXIMUM TIRE PRESSURE, PSI		A	B	C	D	E	F	G	H	J	K	L	M	N
	MAIN GEAR	NOSE GEAR													
A	90	110	222 7	247 8	65 1	81 7	116 9	36 0	39 7	61 9	92 7	10 8	7 9	46 0	13 6
B	90	110	222 7	247 8	65 1	81 7	†	36 0	†	†	†	†	†	46 0	†

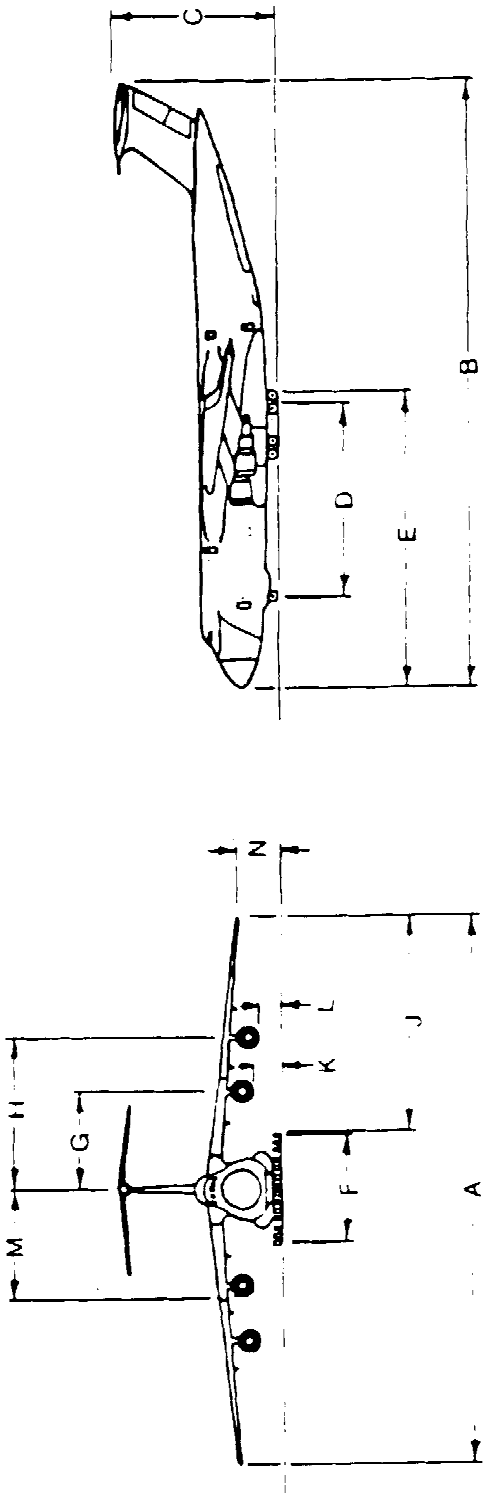


Figure 4. C-5, Galaxy (Lockheed)

MAXIMUM TIRE PRESSURE, PSI		A	B	C	D	E	F	G	J	K	M	N
MAIN GEAR	NOSE GEAR											
40	40	95.6	72.6	31.8	25.7	27.0	23.1	11.8	37.2	1.8	11.6	12.8

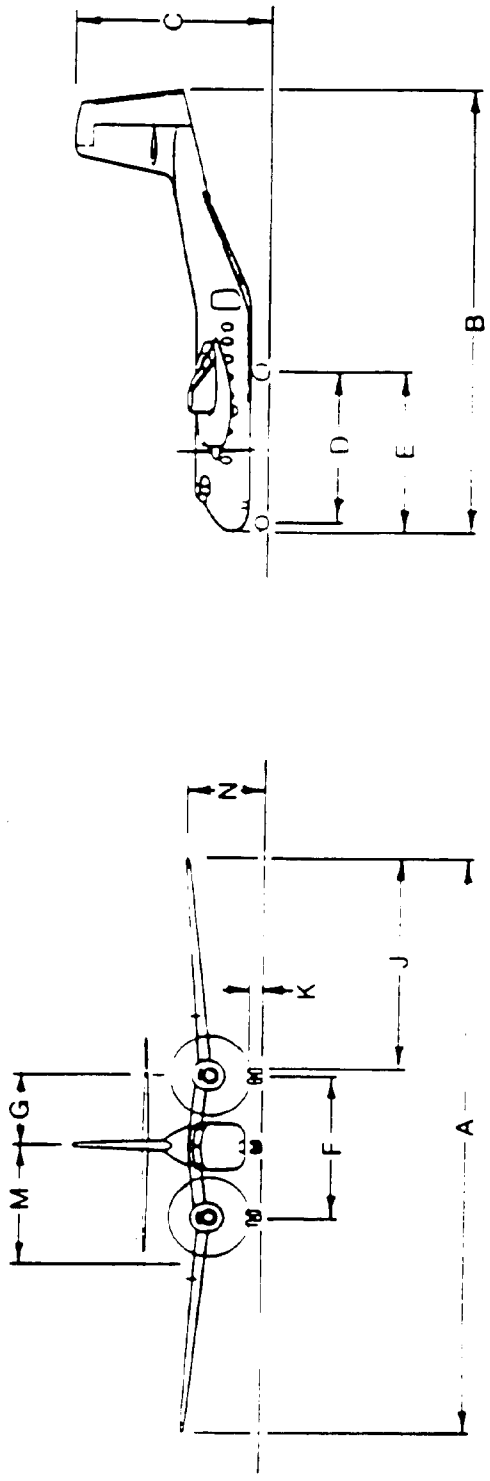


Figure C-5. C-7A, Caribou (De Havilland Canada)

MAXIMUM TIRE PRESSURE, PSI		A	B	C	D	E	F	G	J	K	M	N
MAIN GEAR	NOSE GEAR											
148	135	93 3	119 3	27 5	53 2	60 8	16 4	8 9	36 9	6 4	18 1	7 3

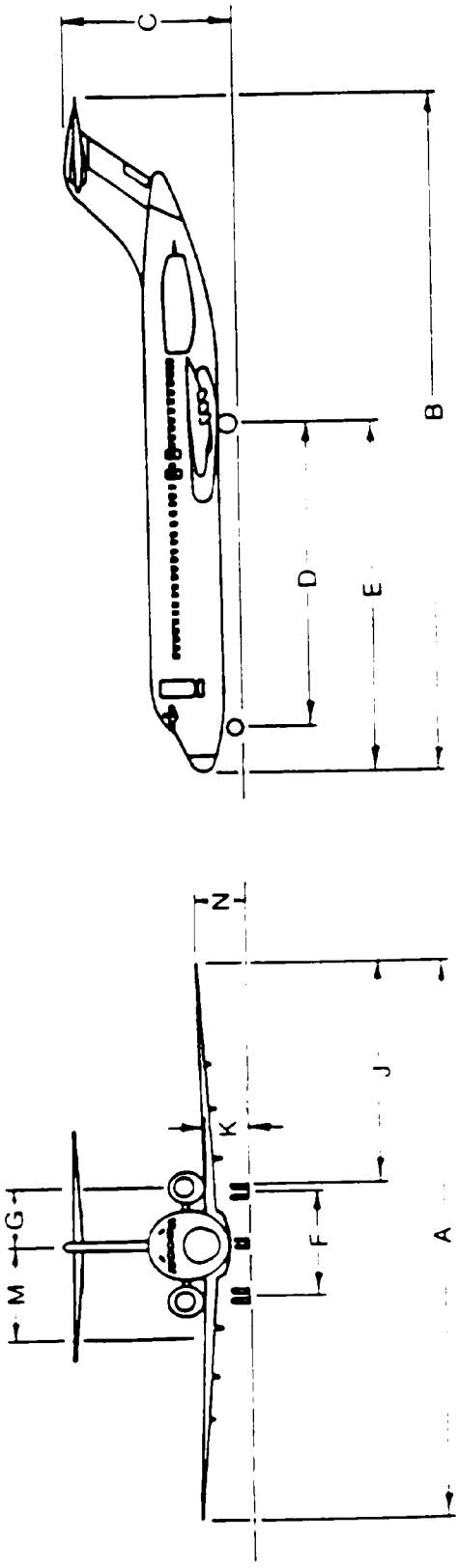


Figure C-6. C-9A, Nightingale (McDonnell Douglas)

MODEL	MAXIMUM TIRE PRESSURE, PSI		A	B	C	D	E	F	G	J	K	M	N
	MAIN GEAR	NOSE GEAR											
A, C, D, F	96	60	54 5	43.8	15 0	15 0	16 6	17 2	8.6	18.7	1 2	12 7	6.4
J	95	60	54 5	57.8	15 0	23 8	†	17 2	8 6	18 7	1 2	14 5	†

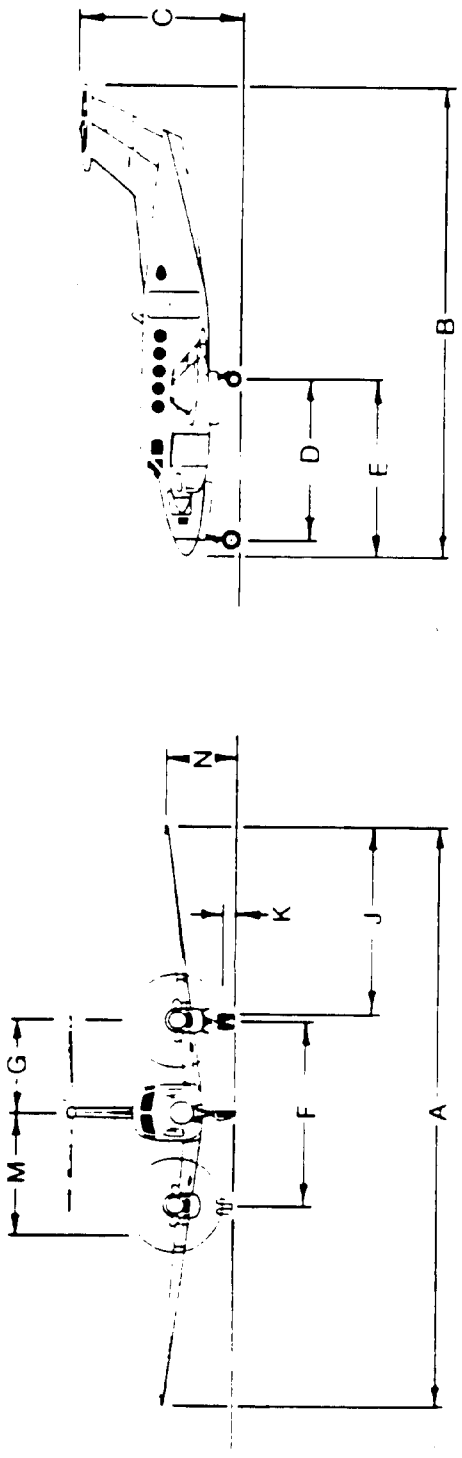


Figure C-7. C-12, Huron (Beech)

MAXIMUM TIRE PRESSURE, PSI		A	B	C	D	E	F	G	H	J	K	L	M	N
MAIN GEAR	NOSE GEAR													
138	155	170.0	174.0	55.1	61.8	†	25.0	†	†	†	†	†	†	†

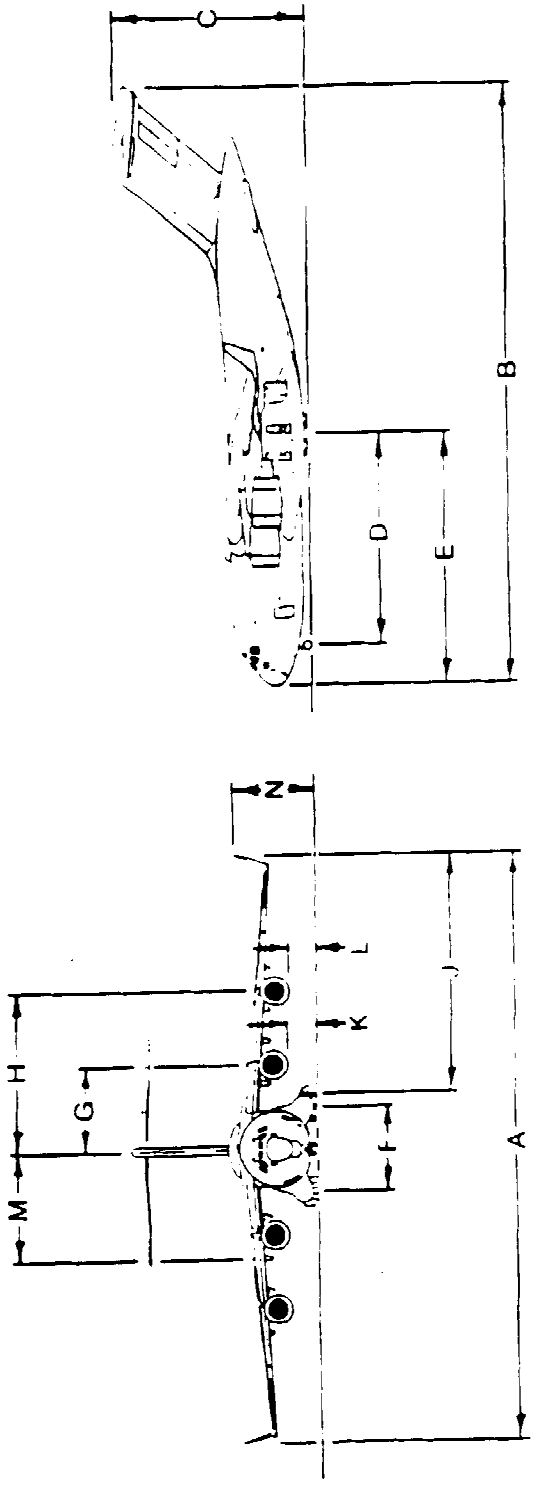


Figure C-8. C-17A (McDonnell Douglas)

MAXIMUM TIRE PRESSURE, PSI		A	B	C	D	E	F	G	J	K	M	N
MAIN GEAR	NOSE GEAR											
175	115	77 8	83 1	24 4	35 2	†	13 7	†	†	†	37 0	†

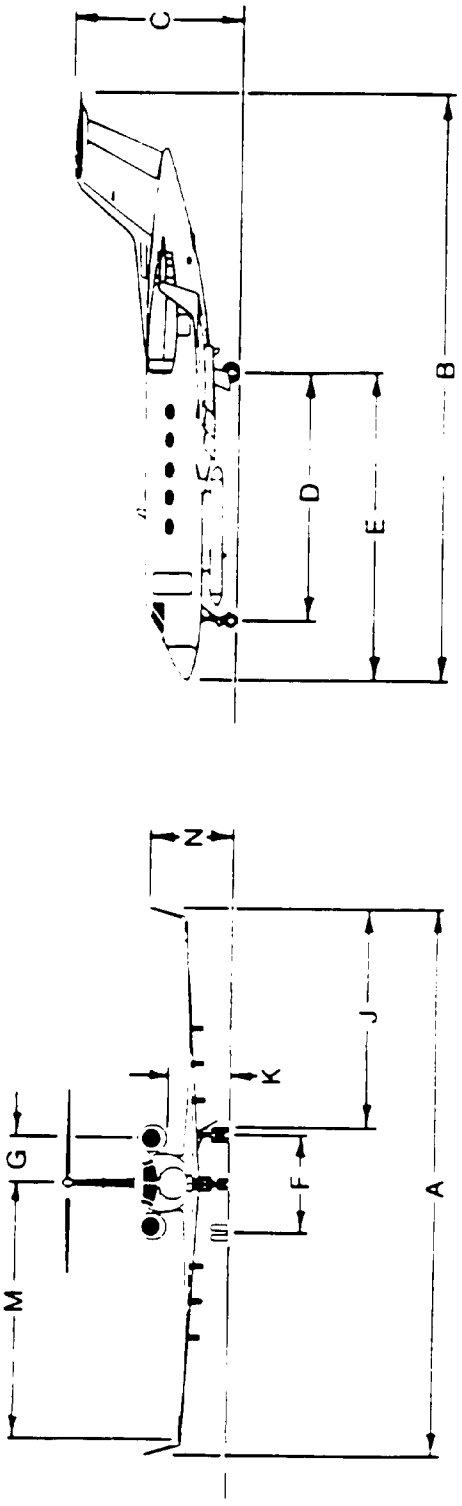


Figure C-9. C-20A/B, G3 (Gulfstream Aerospace)

MAXIMUM TIRE PRESSURE, PSI		A	B	C	D	E	F	G	J	K	M	N
MAIN GEAR	NOSE GEAR											
171	114	39.5	48.7	12.3	20.2	†	8.3	†	15.6	†	20.0	†

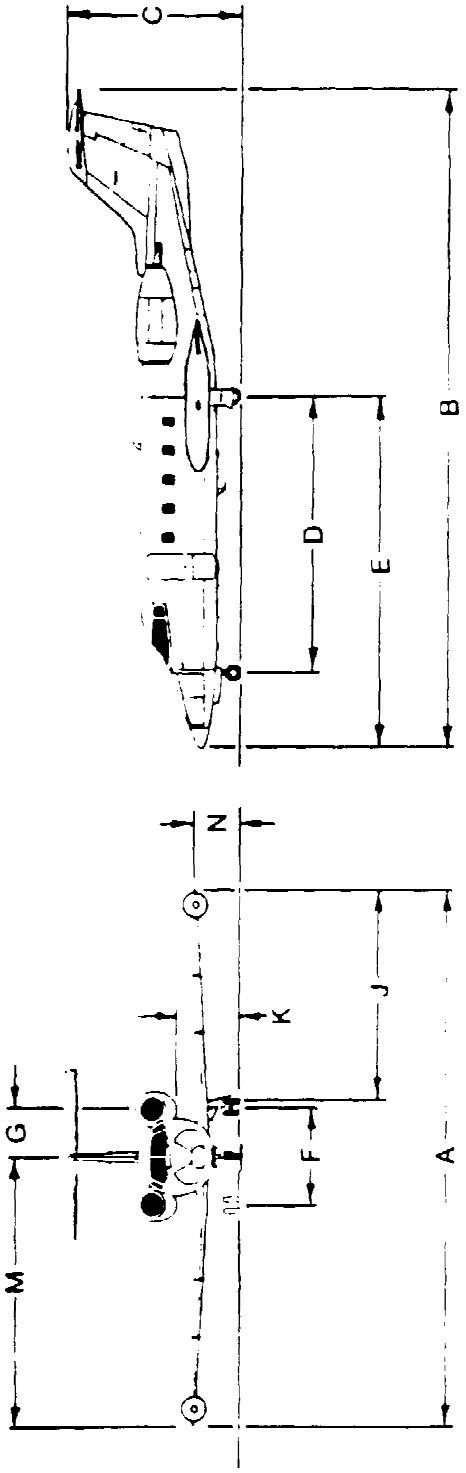
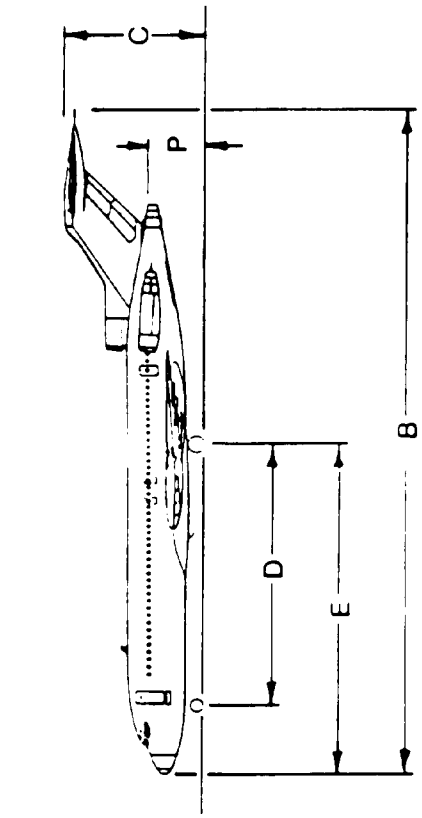


Figure C-10. C-21A (Gates Learjet)

MAXIMUM TIRE PRESSURE, PSI		A	B	C	D	E	F	G	J	K	M	N	P
MAIN GEAR	NOSE GEAR												
174	105	108.0	133.2	34.0	53.3	68.3	18.8	9.3	42.5	10.3	14.3	5.7	12.0



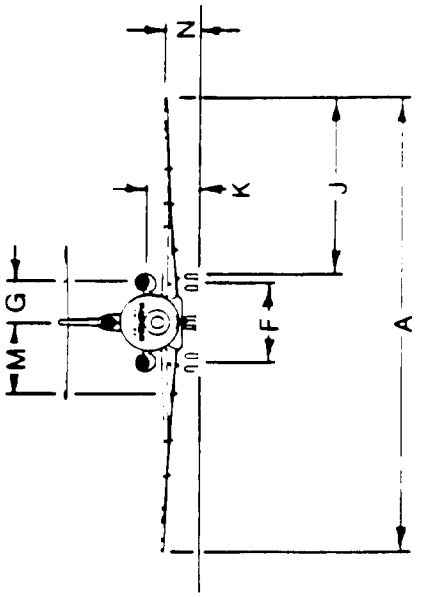


Figure C-11. C-22B (Boeing)

MAXIMUM TIRE PRESSURE, PSI		A	B	C	D	E	F	G	J	K	M	N
MAIN GEAR	NOSE GEAR											
79	55	74.8	58.0	16.3	20.2	28.8	13.9	10.3	30.0	6.0	21.0	12.6

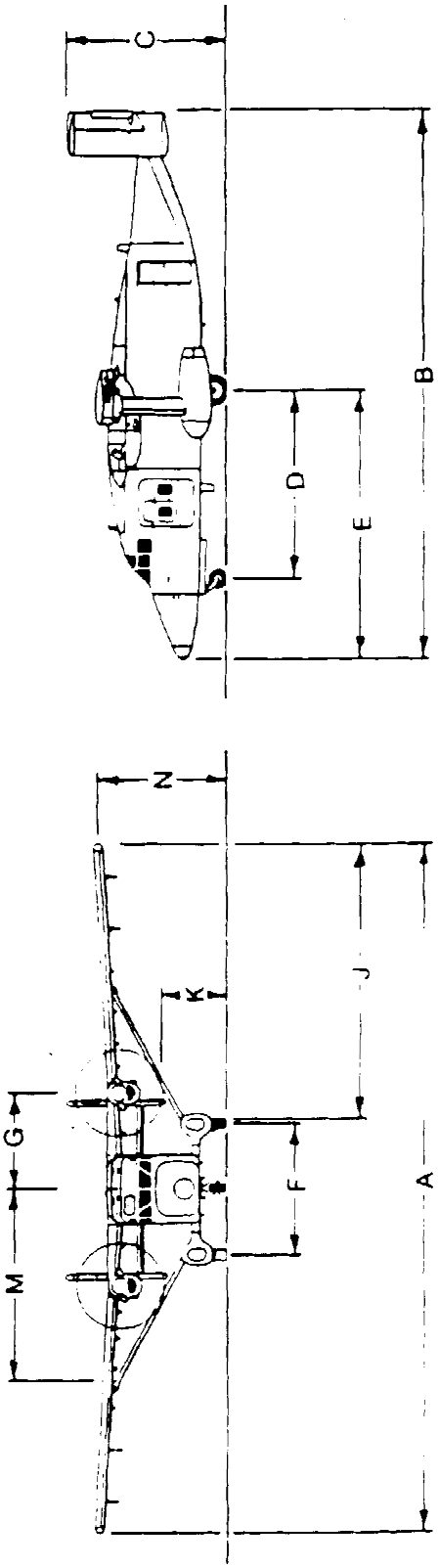


Figure C-12. C-23A, Sherpa (Short Brothers)

MODEL	MAXIMUM TIRE PRESSURE, PSI		A	B	C	D	E	F	G	H	J	K	L	M	N
	MAIN GEAR	NOSE GEAR													
B	119	60	132.6	99.5	38.4	31.8	43.6	14.3	16.3	33.3	60.0	5.8	6.6	18.0	15.0
E	119	60	132.6	99.5	38.3	31.8	43.6	14.3	16.3	33.3	60.0	6.0	6.7	18.0	15.3
H	119	60	132.6	99.5	38.3	31.8	43.6	14.3	16.3	33.3	60.0	6.0	6.7	18.0	15.3

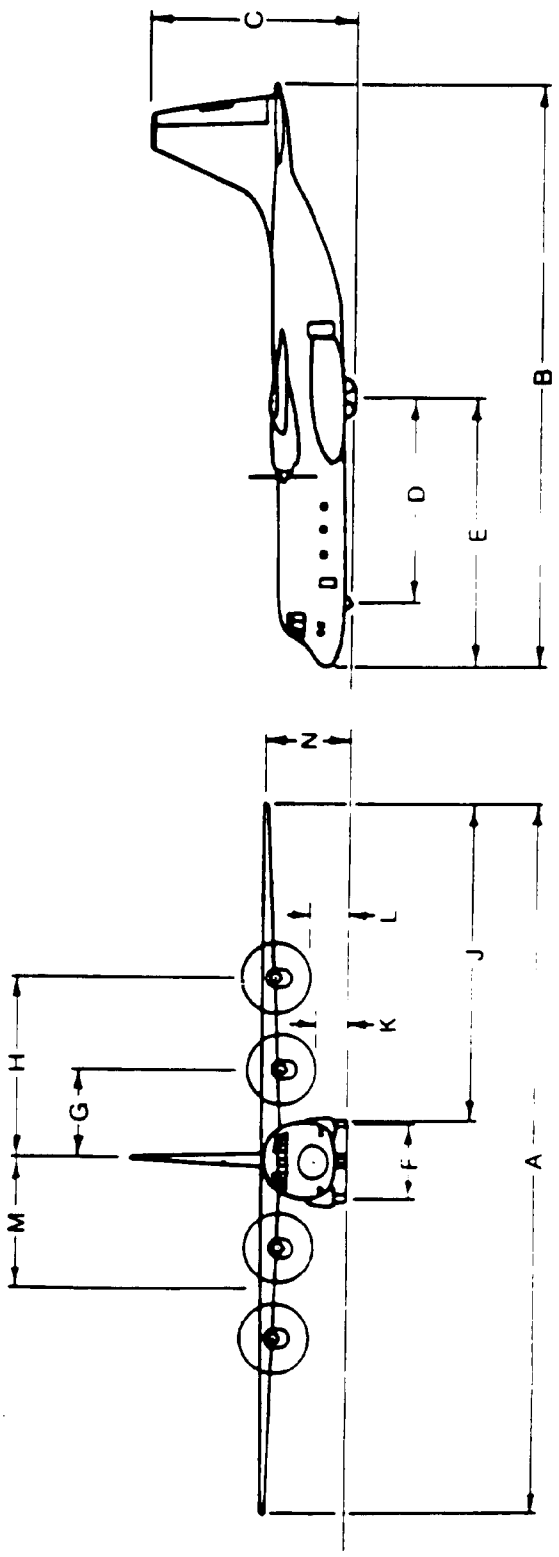


Figure C-13. C-130, Hercules (Lockheed)